“New and Improved” PSMC Systems Engineering Team

Out Brief to PSMC

25 Oct 2007

Overview

- Background
  - “Don’t need no steenkin’ background, man.”
- What’s Been Done
  - “You saw most of this on Tuesday.”
- What’s Yet to Do?
  - “This subject continued from Tuesday”

Excerpted from List of Tasks…

Develop brochures on parts management	DSPO-PM & PSMC
Initiate task with PSMC	
Prepare draft brochures	
Coordinate with PMRIPT	
Prepare final brochures	
Develop articles on parts management for journals, magazines, etc.	DSPO-PM & PSMC
Initiate task with PSMC	(DSP Journal Theme)
Identify publications	
Draft articles	
Submit to publication	
Brief other groups	
Identify groups/organizations/teams, etc. to be briefed	
Prepare briefing materials	
Conduct briefings as needed	
SYSPARS Plan Builder	DSPO-PM (Portal Team)
Develop and Deploy Parts Management Roadshow	DSPO-PM & PSMC
Industry Day…or visits to leading industry partners on MIL-STD-PARTS & Portal	DSPO-PM

Still to Tackle….

- Develop & deploy definitions and glossary items
  - Define “part” in relation to systems Engineering terms such as component, configuration item, etc
  - Define “standard part”
- Refine & deploy measurable/observable criteria for parts risks that can be related to DoD risk checklists in development

Equal Challenge…

- What do we mean by “Logistics Footprint?”
  - In theater?
  - In depots?
  - In supply chain…inventory?
  - What’s included…parts, fuel, water, people, etc?
- What do you mean “Parts Management?”
  - Do you really mean number & movement of spares?
  - In development of systems? Parts Control?

What is a Part?

- This may sound like a trivial question, but I believe the answer is critical mutual understanding and achievement of desired goals.

•MIL-STD-PARTSMGMT defines a Part as

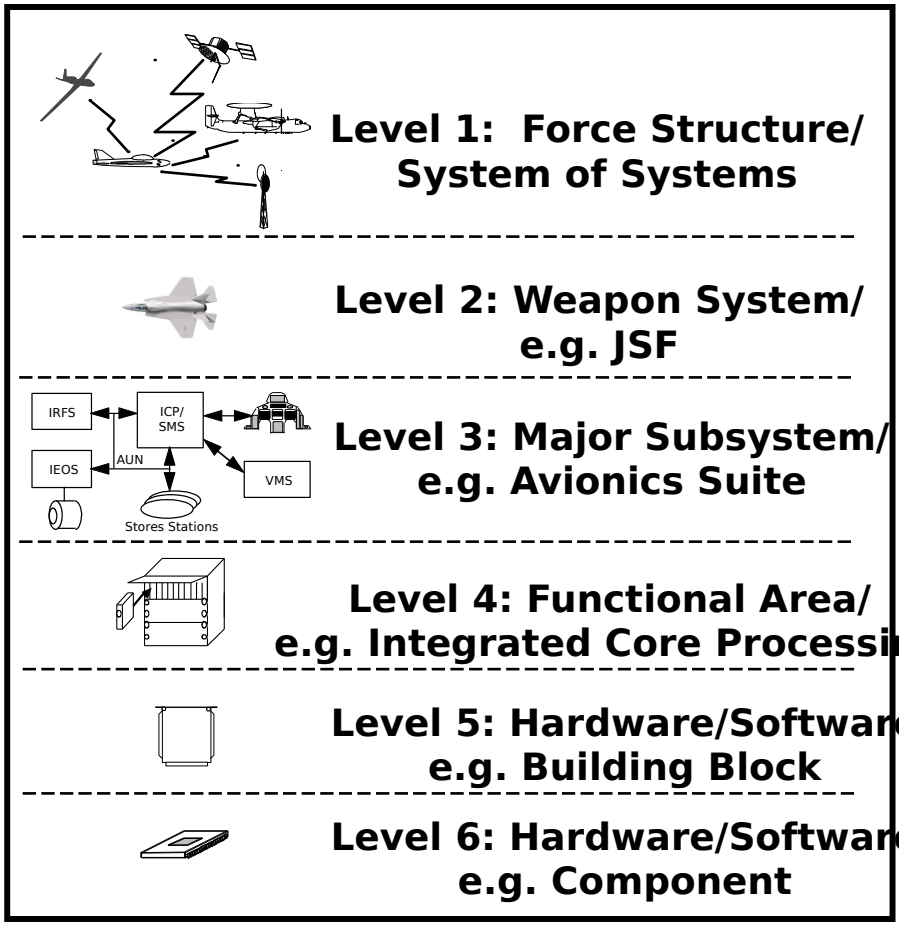
One piece, or two or more pieces joined together, which is **not normally subject to disassembly** without destruction or **impairment of intended design use**

•SEs generally think of ‘parts’ in terms of ‘system elements’

So from an SE perspective, a part might be a component, subsystem, system, system-of-system, or enterprise (as shown in the chart) since all conform to definition of part.

•The actual term used often depends on ones perspective based on their role, or where used in the system’s life cycle or acquisition phase.

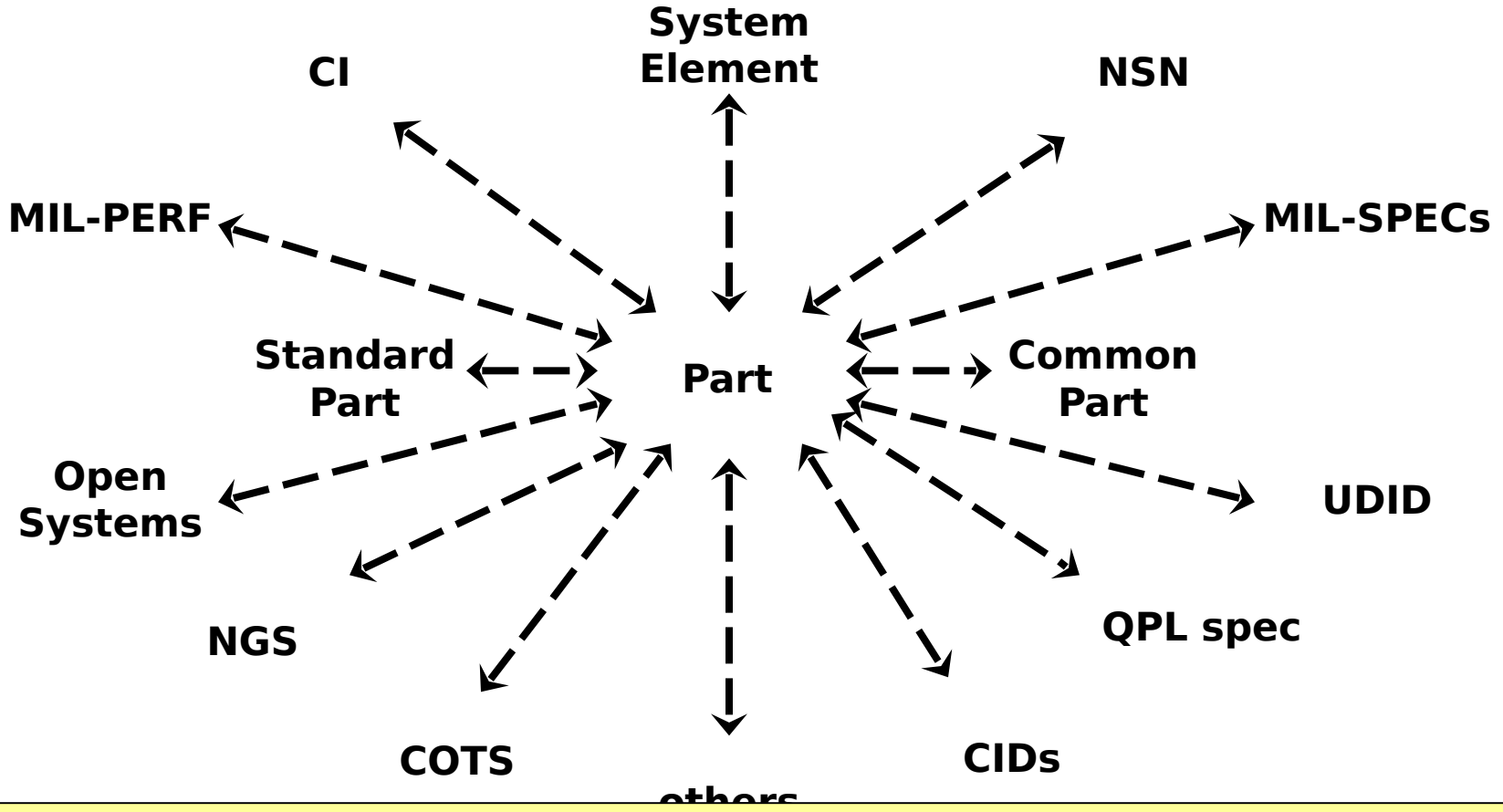
For example, the DAG uses subsystem, component, and configuration item as synonyms for system element depending on the systems engineering or acquisition context.



From a Parts Management perspective, which level(s) of ‘parts’ are we talking about?

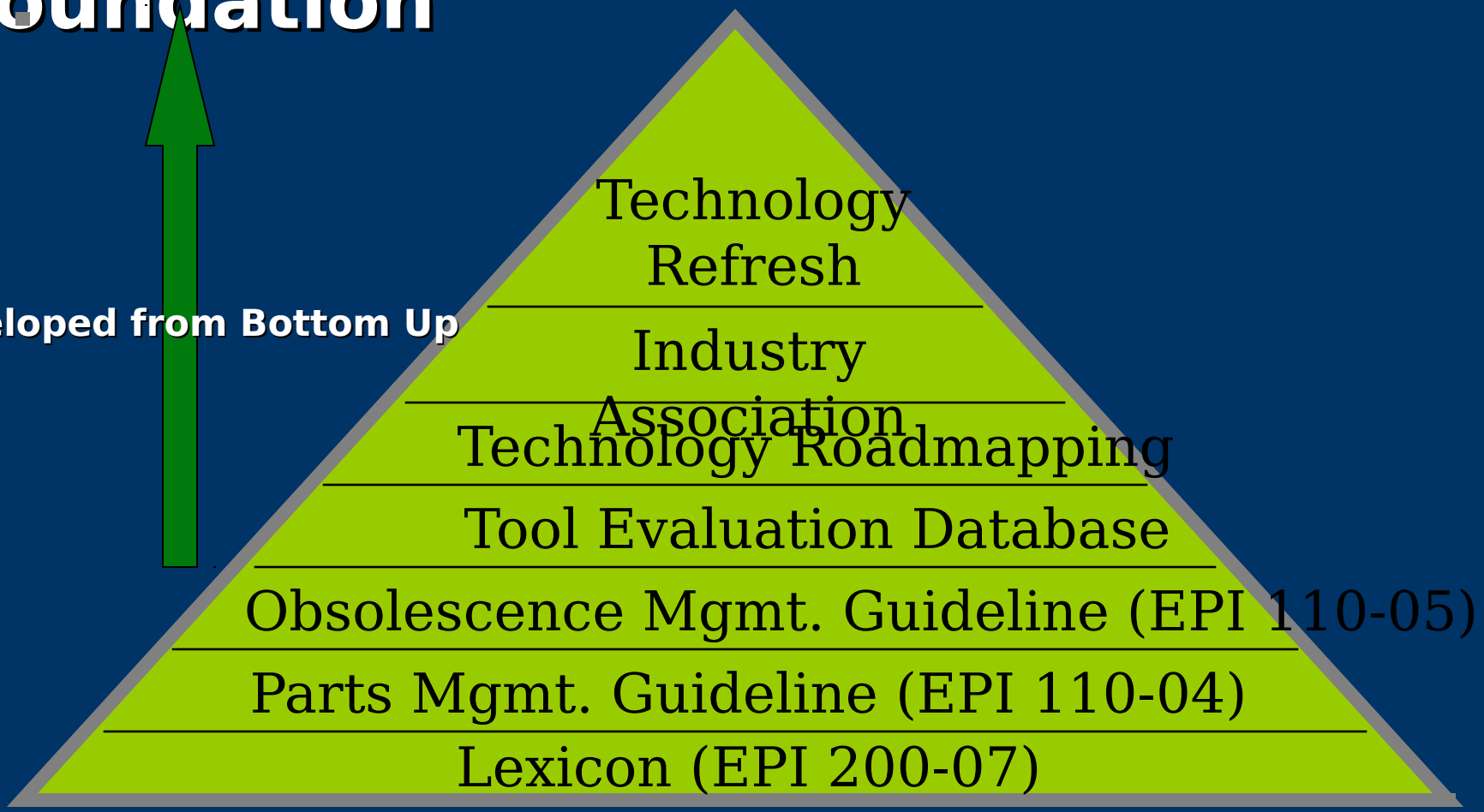
The Lexicon Challenge

- Need to understand how these concepts relate
  - Which are same, similar and integral in achieving Parts Management objectives/benefits



Which of these are used to specify, define, identify or select ‘standard part’?

Lockheed Martin Process Foundation



LM proactively managing through systems engineering process

SSE Views on Parts Management

- Should be a design consideration as part of the SE process
  - Establish metrics (e.g., minimize # of unique parts) to encourage use of standard parts, when warranted
  - Use SE trade studies to balance with cost, availability, reliability and other design considerations

- Provide incentive to primes and lower tiers through the contract to use parts already in DoD system that meet requirements (i.e. reliability, affordability)
  - It costs $$ over the life of the program just to maintain a part in the system

- Design systems using industry standard parts or commercial-off-the-shelf (COTS) parts when it makes sense
  - Use existing/preferred parts lists to eliminate need to develop detailed drawing package.

SSE Views on Parts Management (cont)

- Use existing parts to eliminate need for new production tooling, or design parts that can be produced easily and contain fewer parts (i.e. moldings/castings)
  - Simplifies oft-overlooked things like set-up time and shop parts control
  - Key point is to include production engineers up front

- Anticipate Diminishing Manufacturing Sources and Material Shortages
  - Avoid manufacturers that could possibly go out of business
  - Avoid material that could wind up to be in short supply (certain raw materials, metals, or end items that will be replaced in the future by emerging technologies).
  - Use trusted sources to build parts as much as possible

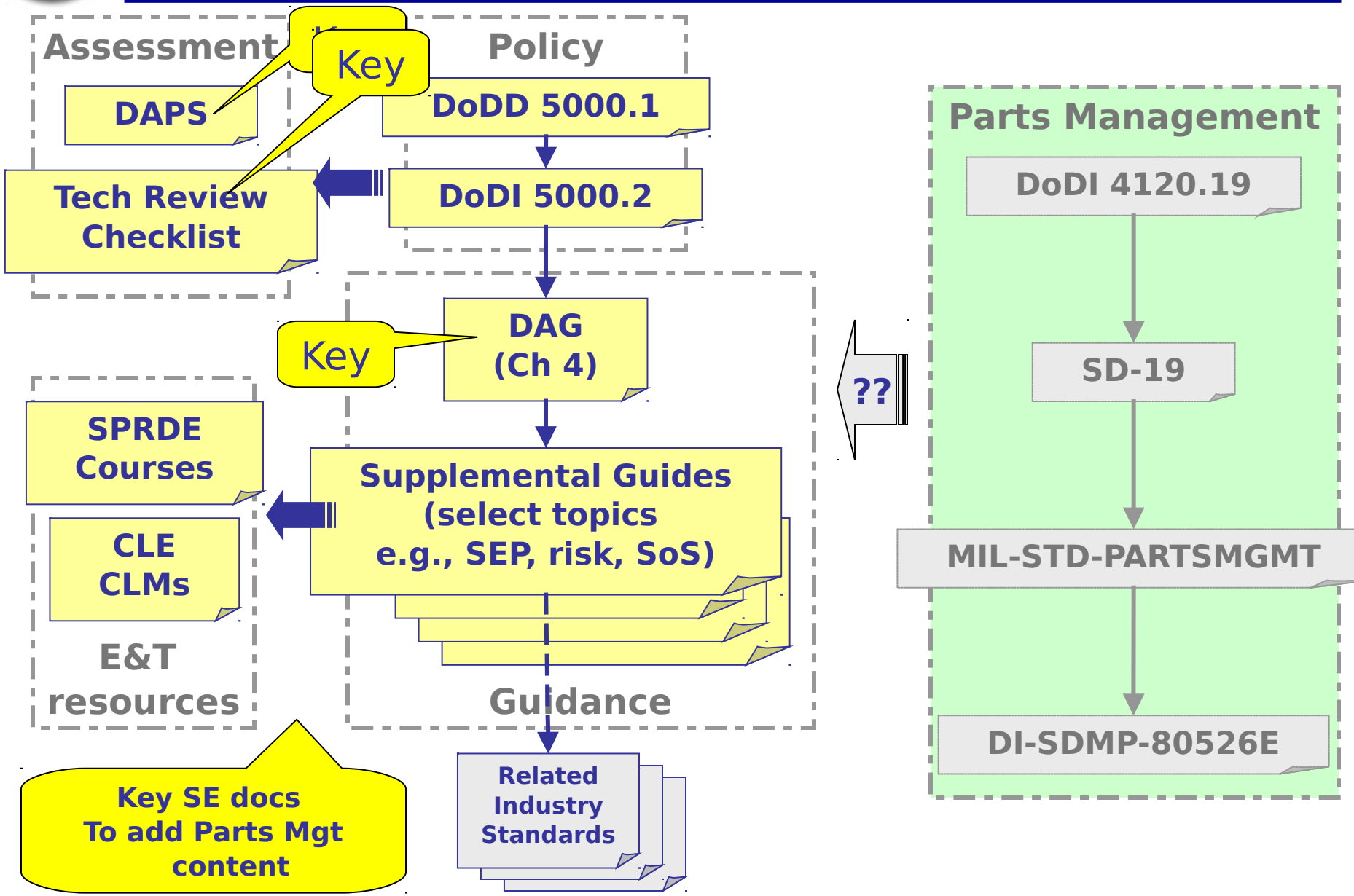
- Adapt to common support equipment rather than build a new unique item of support equipment (cuts logistics footprint)
  - Key point is to include logistics considerations up front

Summary

From Bob Skalamera's brief to
DSP Parts Management panel

- ODUSD (A&T)/SSE actions to ensure Parts Management becomes more integrated with systems engineering and acquisition program oversight
  - Incorporation into Systems Engineering portion of **Defense Acquisition Guide**
  - Inclusion in Risk **Checklists for** consideration at **Technical Reviews**
  - Inclusion as consideration in **Technical Planning**
  - Inclusion in **DAPS** methodology for Program Support Reviews

Elements of SE
Policy, Guidance, E&T and Assessment



Defense Acquisition Guidebook (DAG), Ch 4, Systems Engineering

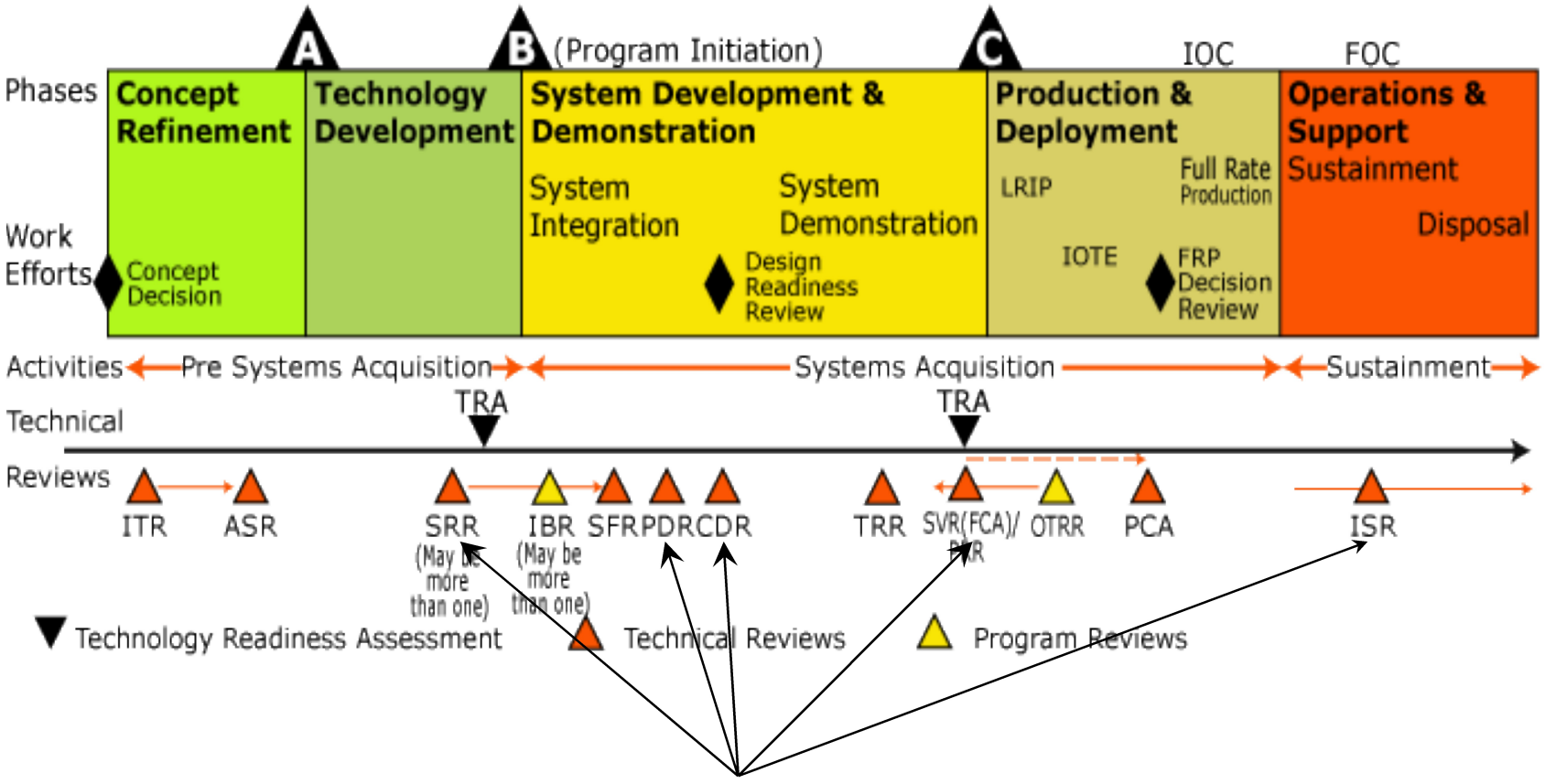
- http:www.acq.osd.mil/se/publications.htm

- Proposed content of new DAG section for Parts Management
  - An overview of the goals of Part Management
    - Reduce logistics footprint and total life cycle costs
  - What a part is and its relationship to other system elements and configuration items
  - Brief discussion of fundamental SE processes that support Parts Management
    - Configuration management, technical assessment, decision analysis, design solution, implementation, verification and technical reviews
  - Suggested elements for creating a part management program that
    - Leverages fundamental SE processes
    - Documented in Systems Engineering Plan
  - Reference new MIL-STD-PARTSMGMT, SD-19, and industry guides for additional implementation details

Parts Management Criteria for Technical Reviews & Program Assessments

- Can be added to two SSE tools:
  - Technical Review Checklists
    - Formerly Risk Checklists
    - Derived from NavAir Risk Checklists
    - One for each of 11 review types (ASR, PDR, CDR, etc)
    - Contains questions pertinent to several key topics
      - Planning, schedule, staffing, requirements, etc
    - Posted at DAU SE Community of Practice (COP)
      - Under *SE Special Interest... > Technical Review...*
      - https://acc.dau.mil/CommunityBrowser.aspx?id=144143
  - Defense Acquisition Program Support (DAPS)
    - Methodology provides useful “triggers” for discussion at major acquisition reviews
    - Provided a phase-oriented checklist that should be tailored based on objectives and expertise of independent assessment teams
    - Posted at http://www.acq.osd.mil/se/as/publications.htm
    - Currently undergoing update
- Recommend Parts Management specific criteria
  - In terms of generic SE processes and artifacts, and
  - Such that it can be used in these and similar tools

Program Technical Reviews



Part Management is an important design consideration

Systems Engineering - Revitalization Efforts Supporting DMSMS

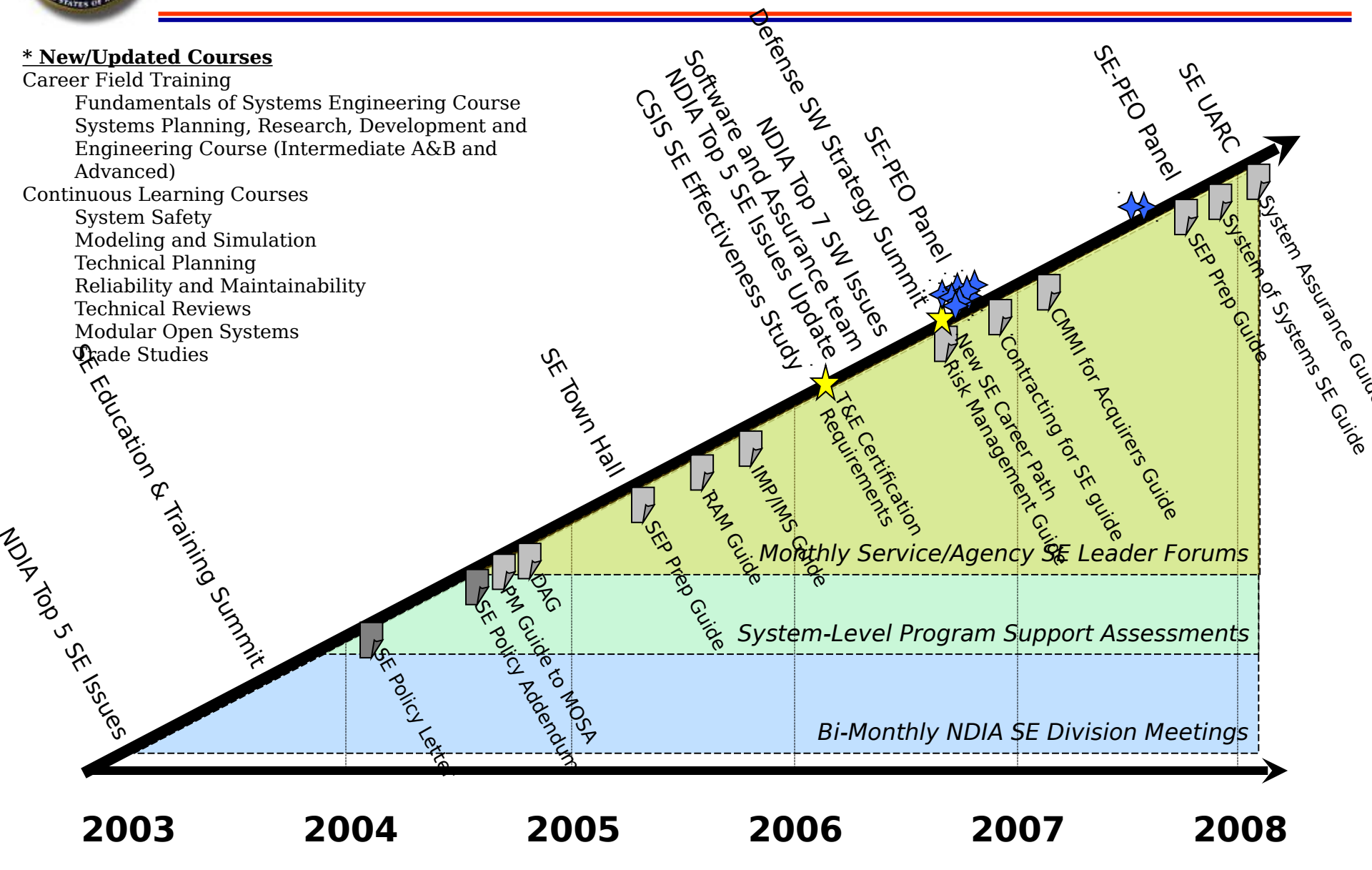
Systems and Software Engineering (Enterprise Development)
Office of the Deputy Under Secretary of Defense (A&T)
29 October 2007

System Engineering Revitalization Effort

*** New/Updated Courses**

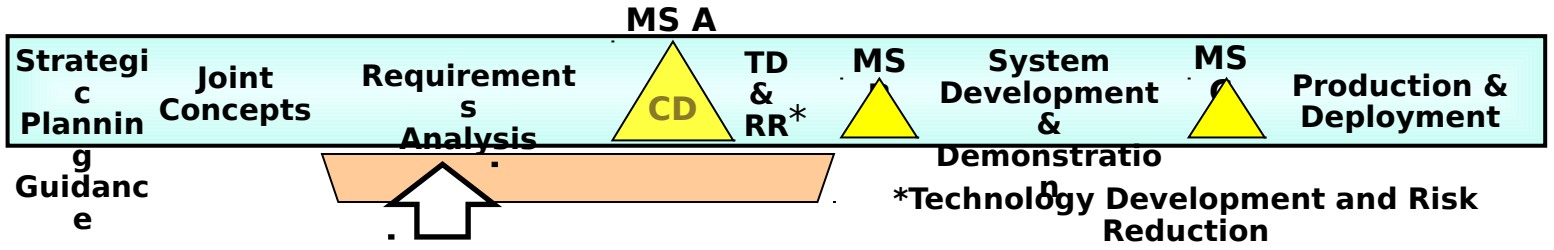
Career Field Training
- Fundamentals of Systems Engineering Course
- Systems Planning, Research, Development and Engineering Course (Intermediate A&B and Advanced)

Continuous Learning Courses
- System Safety
- Modeling and Simulation
- Technical Planning
- Reliability and Maintainability
- Technical Reviews
- Modular Open Systems
- Trade Studies



Make Decisions that Balance the Trade Space Early in Lifecycle Planning

- Early lifecycle involvement of Systems Engineering to:
  - Inform evaluation of alternatives with technical insights
  - Ensure solutions balance requirements with technical feasibility
  - Ensure solutions can be validated and verified
  - Use Modeling & Simulation to help refine warfighter concept of operations/system requirements, evaluate design alternatives, and identify potential technology/human interface constraints
  - Begin to identify “design considerations”
- Appropriate resourcing (personnel/funding) required
- Include in requirements, specifications, and contracts



Begin to Think DMSMS and Parts Management Early

Life Cycle Sustainment Outcome (Materiel Readiness)

- **Materiel Availability (KPP*)**
  - A Key Data Element Used In Maintenance and Logistics Planning
  - Different From Operational Availability
- **Materiel Reliability (KSA*)**
  - Provides A Measure Of How Often The System Fails/Requires Maintenance
  - Another Key Data Element In Forecasting Maintenance/Logistics Needs
- **Mean Downtime**
  - A Measure Of How Long A System Will Be Unavailable After A Failure
  - Another Key Piece Used In The Maintenance/Logistics Planning Process
- **Ownership Cost (KSA*)**
  - Focused On The Sustainment Aspects Of The System (Not The Operations)
  - An Essential Metric For Sustainment Planning And Execution
  - Useful For Trend Analyses – Supports Design Improvements/Modifications
- **Other Sustainment Outcome Metrics May Be Critical To Specific Systems, And Should Be Added As Appropriate**

* Sustainment KPP & KSAs Included In Revised Draft CJ CSM 3170

These 4 Life Cycle Sustainment Outcome Metrics Are Universal Across All Programs And Are Essential To Effective Sustainment Planning

Designing For Sustainment with Systems Engineering

September 26, 2007

for

Systems and Software Engineering

Office of the Deputy Under Secretary of Defense (A&T)

Evolution of DoD Support Strategies

From Outputs... → To Outcomes...

Next…

Expanding the Performance Concept

Sustainment KPP Approach
- Enterprise-wide, life cycle focus
- Full System accountability
- Alignment of resources to Outcomes

Early 2000s

Performance Based Logistics & TLCSM

Partial movement to Outcomes
- PM life cycle focus but **…**
- Better System accountability
- Improved alignment of resources & outcomes

1990s

Performance Spec Functional Transactions

"What", not "How" emphasized
- Still limited System accountability & life cycle focus
- Resources aligned to discrete outputs

1980s

Mil-Spec Functional Transactions

"What" & "How" defined at transaction level
- Limited life cycle focus
- Little System level accountability
- Resources aligned to discrete outputs

PSR Focus Differences

Pre-MS A

- Initial Capabilities Documentation (ICD)
- Results of system concept studies
- Analysis of Alternatives
- Technology Development Strategy
- Technology Development Planning
- Technology Risk Reduction
- Systems Engineering planning

Pre-MS B

- Results of Technology Development and Maturation
- Capabilities Development Documentation (CDD)
- Feasibility and stability of requirements
- Incorporation of MOSA, Net Centric capability
- Acquisition Strategy
- Test and Evaluation Strategy
- Application of systems engineering process in design, test, and verification
- Design producibility and transition to production planning
- Logistics metrics including supportability, reliability, maintainability

Pre-MS C

- Design Baseline status
- Status of system demonstration, test, and evaluation
- Execution of systems engineering process
- Production metrics and process controls
- Transition to production planning
- Operational test verification
- Logistics metrics verification (maintenance/training)

PARTS MANAGEMENT VISION
A Forward Look

- Parts management is incorporated in eight appropriate sections of Systems Engineering process flow including all configuration audits and milestone reviews.
- Parts management is required in all contracts for new and major modifications for DoD systems:
  - Parts management plan required as part of Systems Engineering Master Plan
  - Contractor parts management plans approved based on parts selection for reliability, quality, and standardization, and to minimize impact of part obsolescence

PARTS MANAGEMENT VISION
A Forward Look

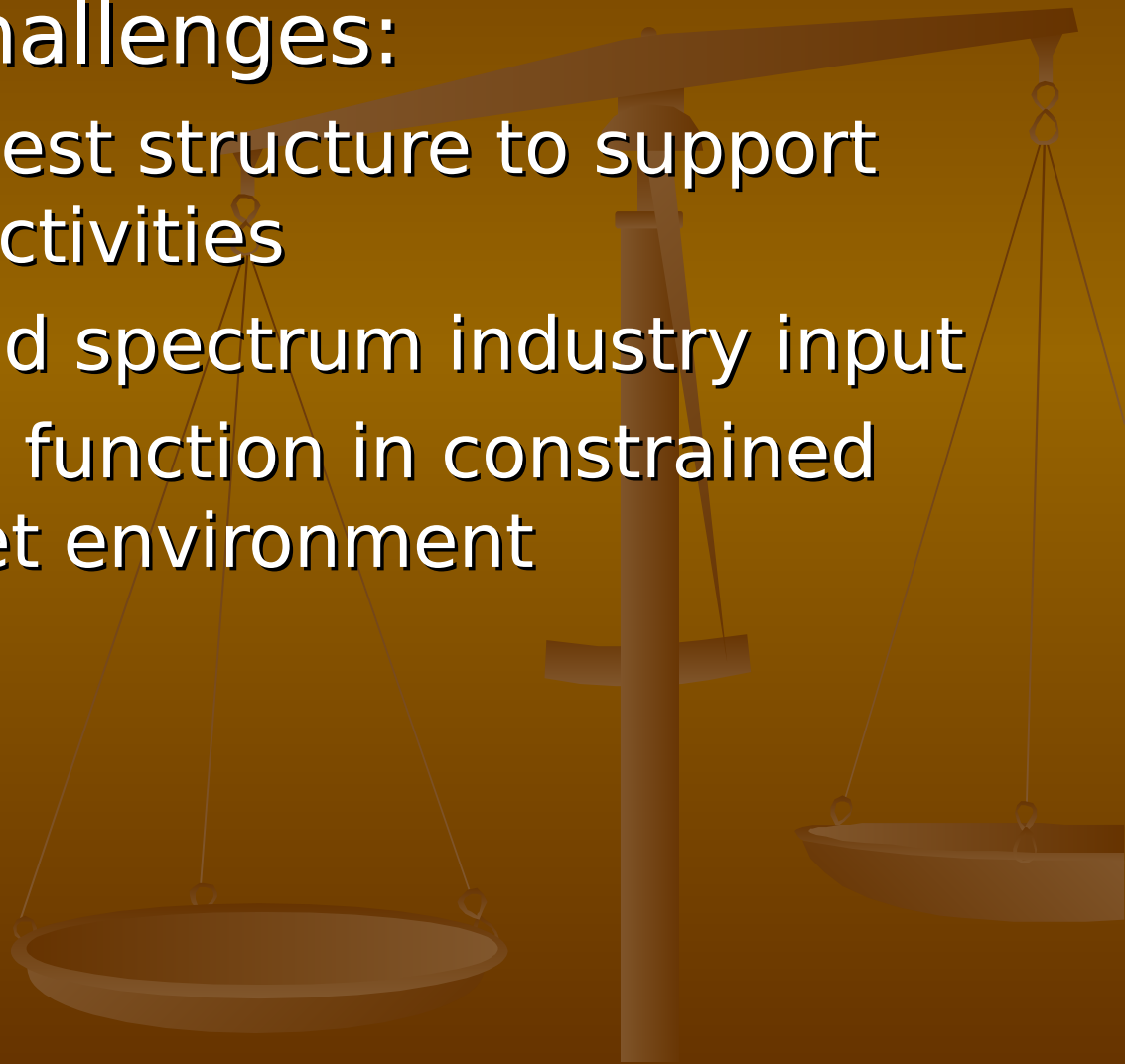
- Parts management tools help:
  - design and PBL contractors to make the best decisions, and
  - help government program offices manage parts management processes:
- Parts management information systems and selection tools have complete and up-to-date information;
- Parts management tools are “self-help” so that contractors manage parts management processes in the best interest of the DOD.

PSMC Forward Look

- PSMC future
  - Short term – work with PMRIPT and DMS/MS Working Group to develop appropriate policies and procedures;
  - Medium term – work with PMRIPT and DMS/MS Working Group to develop appropriate implementation strategies, training, marketing, etc. to implement balance of PMRWG implementation plans; monitor parts management activities to ensure effectiveness, and to recommend policy and procedural changes as needed;
  - Long term – provide support as needed to parts management; Consider potential merger with DMS/MS Working Group.

PSMC Issues

- Near term challenges:
  - Determine best structure to support short term activities
  - Provide broad spectrum industry input
  - Find ways to function in constrained travel budget environment



PSMC Objectives

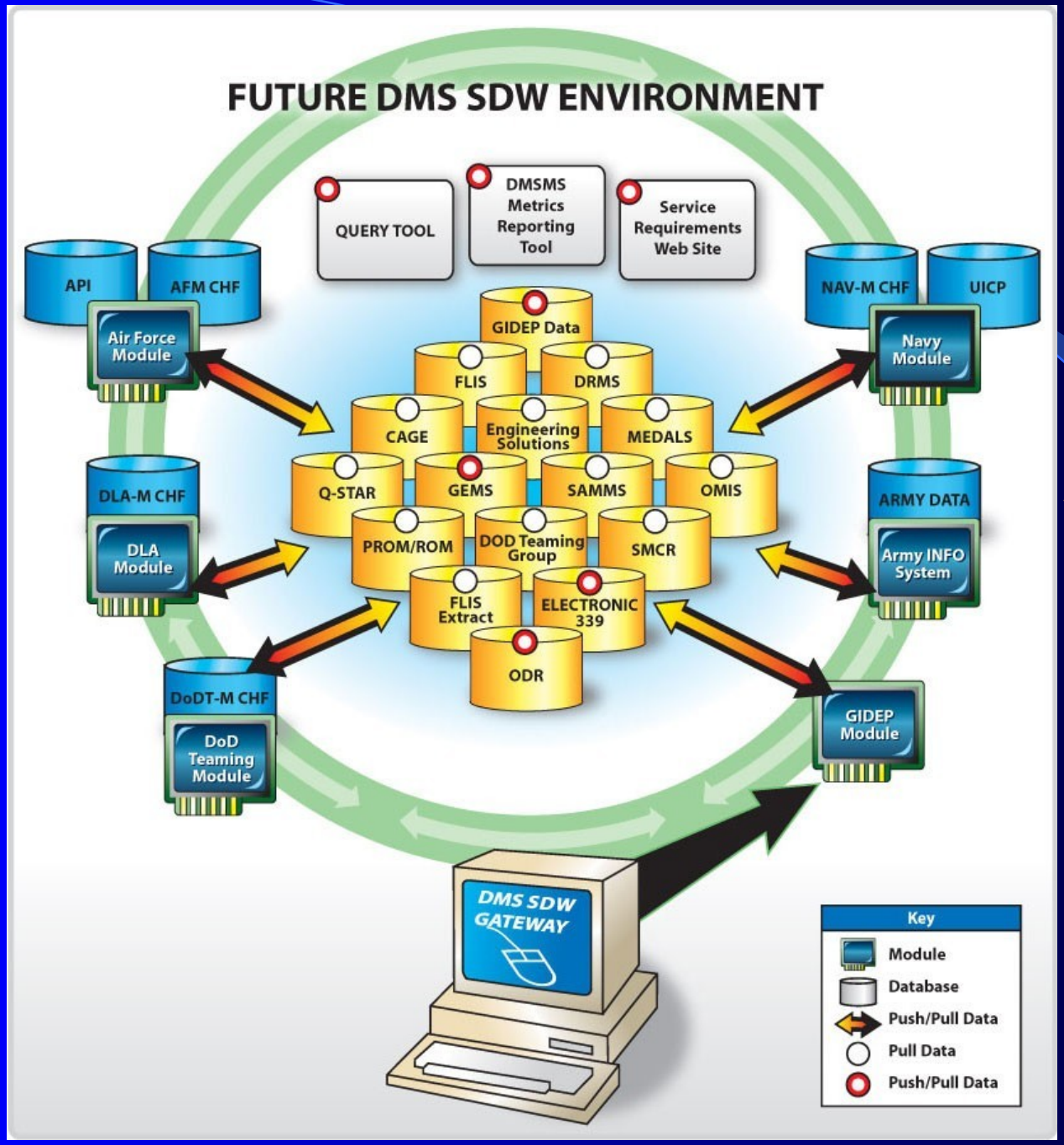
PSMC Mission: To provide a standing forum for communication and collaboration between DoD and industry to promote and enable effective parts management in support of the warfighter.

We achieve this by:

- Promoting the benefits of Parts Management
- Reducing life cycle costs by promoting part and process commonality
- Advocating commercial/industrial part standardization.
- Promoting parts management education and training.
- Developing parts management tools
- Promoting a standard parts database.
- Assisting in developing cost-effective parts management programs.
- Mitigating the impact of obsolescence.

Major PMRWG Recommendations

- Restore parts management as an engineering discipline
- Make parts management a contractual requirement
  - Identify effective incentives
- Create a Parts Management Knowledge Sharing Portal
- Improve DOD organization for parts management
- Build key partnerships and relationships
  - Educate and train
- Develop parts management tools and metrics
- Develop new marketing products
- Understand parts management's contribution to logistics footprint



Shared Data Warehouse

Keep it alive!

Parts Management

TLCSM Executive Engineering Council

XX/XX/2008

, Director

Defense Standardization Program Office

When will we know we're done?...

Don’t worry…we’ll know it!